CrystaLaser®
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Diode pumped infrared 1064 nm *CrystaLaser*®

High reliability High stability Single longitudinal mode Ultra-compact

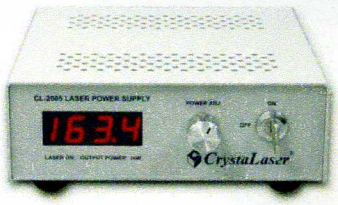
SPECIFICATIONS

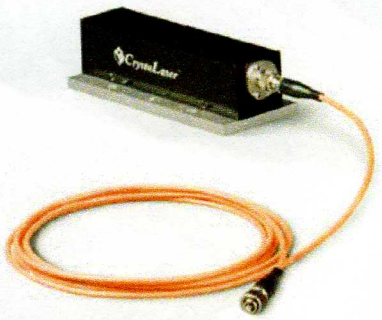
Wavelength	1064 nm			
Laser crystal	Nd:YAG/Nd:YVO_4			
Laser version	Standard version		SLM version	
Model No. and output power	CL1064-3W0	3W	CL1064-1W0-S	1 W
	CL1064-2W5	2.5 W	CL1064-700-S	700 mW
	CL1064-2W0	2 W	CL1064-500-S	500 mW
	CL1064-1W5	1.5 W	CL1064-400-S	400 mW
	CL1064-1W0	1 W	CL1064-300-S	300 mW
	CL1064-800	800 mW	CL1064-100-S	100 mW
	CL1064-500	500 mW	CL1064-050-S	50 mW
	CL1064-300	300 mW	CL1064-010-S	10 mW
	CL1064-100	100 mW		
Longitudinal mode spectrum	Multiple		Single; frequency tuneable option available	
Coherence length	1 - 5 mm		> 300 meters	
Linewidth	0.3 nm, nominal		< 10^{-5} nm	
Modulation options	TTL 1kHz, 3 kHz, 10 kHz, 50kHz Analog control, Analog modulation		TTL on/off option	
Output stability (rms)	< 1.5% over 24 hours; ultra-stable option: 0.5% or 0.25% over 24 hours			
Transverse mode	Single mode, TEM_{00}, M^2 = 1.0 - 1.2			
Beam diameter ($1/e^2$)	0.4 mm	Option: 2X - 5X laser beam expanders are available to change beam size and divergence e.g. 0.8 mm beam with 2 mrad divergence; or 2 mm beam with 0.8 mrad divergence		
Beam divergence	4 mrad			
Beam pointing stability	< 0.005 mrad/°C			
Polarization ratio	100:1; Horizontal linear polarization			
Operation temperature	10 °C to 35 °C			
Warm-up time	< 1 minute			
Operation voltage	90-250 VAC or 12VDC OEM version 11-16VDC; Typical power consumption: 10 W			
Dimensions and weight of laser head	3x3x12 cm^3 (1.2x1.2x4.7 in^3) with a fixed 6 mm thick plate, 0.3kg (0.6 lb) 7x3.6x18.5 cm^3 (2.8x1.4x7.3 in^3), 0.6 kg (1.3 lb) for lasers ≥ 2 W, type 2 size			
Dimensions and weight of power supply	AC: 5x14x15 cm^3 (2x5.5x6 in^3), 0.5 kg (1 lb) DC: 8.5x3.5x12.7 cm^3 (3.3x1.4x5 in^3), 0.2 kg (0.5 lb); option CL-2005 power display AC: 5 x 16 x 15 cm^3			

FWHM →

Fiber coupling option: Single mode and multi-mode fiber delivery.
CL-2005 power supply option: Power adjustable and power digital display.

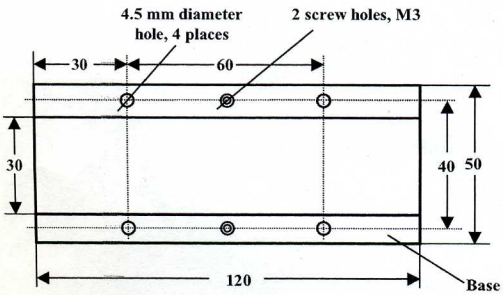
Made in the USA



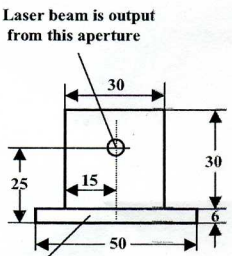


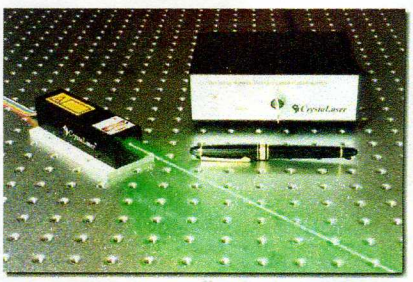
Laser Head All dimensions in mm

Top View



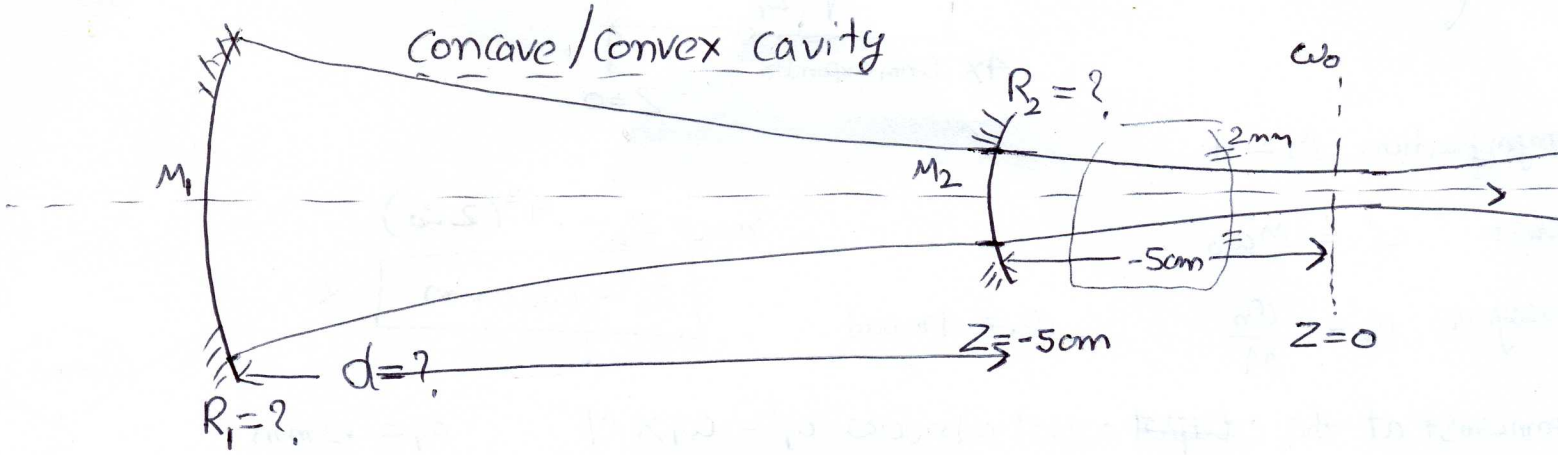
Front View





Mechanical dimensions of the laser head and power supply of infrared laser are the same as the green laser.

Case I: In case, beam waist ω_0 is 5cm from the output window; outside of the laser; Ours Cavity should look like this.



We know beam waist at the output window M_2 $\omega(z=-5cm) = .2mm$

Divergence $\theta = 4 \times 10^{-3}$ rad

$\lambda_0 = 1064 \times 10^{-6}$ mm

The Beam waist at $Z=0$ is: $\theta = \frac{2\lambda}{\pi \omega_0} \Rightarrow \omega_0 = \frac{2\lambda}{\pi \theta}$

$\omega_0 = .169mm \approx$ **$\omega_0 = .17mm$**

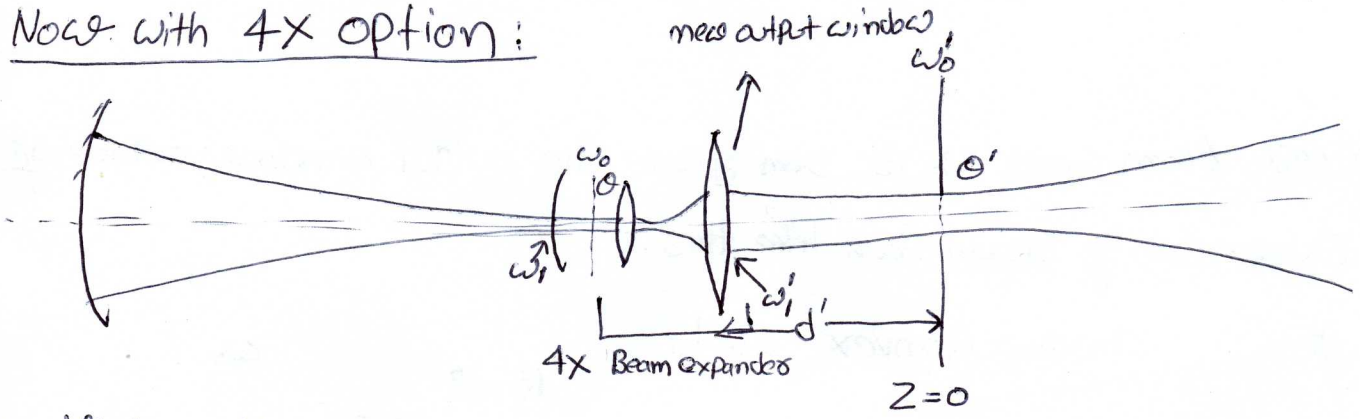
To check if this agrees with the specified beam waist at $Z=-50mm$

$$\omega(z=-50mm) = \omega_0^2 \sqrt{1 + \left(\frac{z}{z_0}\right)^2}$$

where $z_0 = \frac{\pi \omega_0^2}{\lambda_0} \Rightarrow$ **$z_0 = 85mm$**

$\omega(z=-50mm) = .197mm \approx .2mm$ ↓↓ It AgReeS

Nova with 4X option:



magnification $M = 4$

waist $\omega_0' = M\omega_0$

Divergence $\Theta_0' = \frac{\Theta_0}{M}$ $\quad \Theta_0 = 4\,mrad$

nova $Z_0' = M^2(2Z_0)$

$\boxed{Z_0' = 1360\,mm}$

Same

Beam waist at the ~~output~~ output window $\omega_1' = \omega_1 \times M$ $\quad \omega_1 = .2\,mm$

nova beam waist at nova output window $\omega_1' = .2 \times 4 = .8mm$

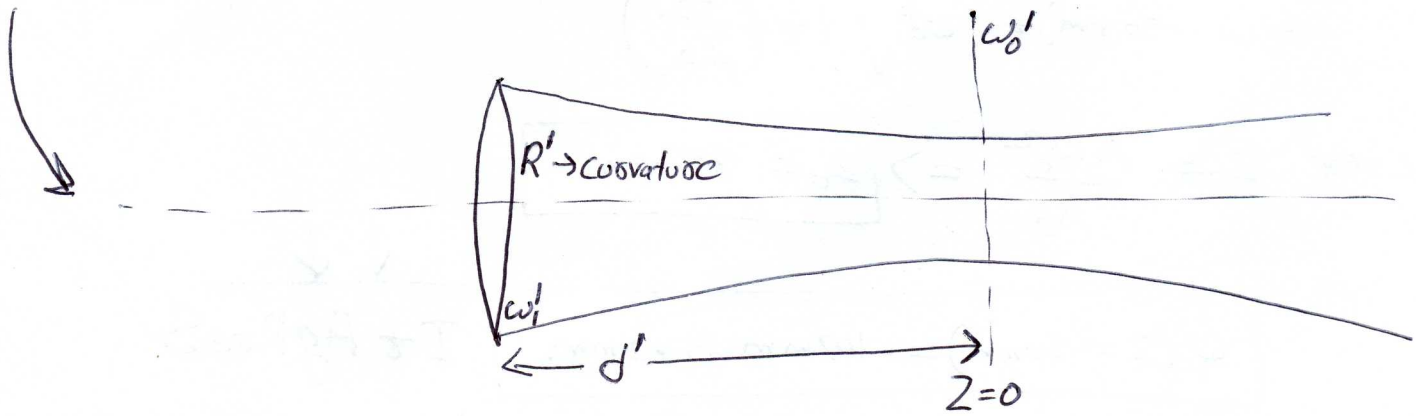
Divergence $\Theta' = \frac{4}{4} = 1\,mrad$

Now the nova beam waist at $Z=0$ $\omega_0' = \frac{2\lambda}{\pi\Theta'} = .68\,mm$ $\quad \boxed{\omega_0' = .68mm}$

also nova $\boxed{Z_0' = \frac{\pi\omega_0'^2}{\lambda_0} = 1360\,mm}$

Now the distance d' where the nova beam waist exsists from the output window

$\omega_1' = \omega_0' \sqrt{1 + \left(\frac{z}{z_0'}\right)^2}$ $\quad \boxed{z = d'}$

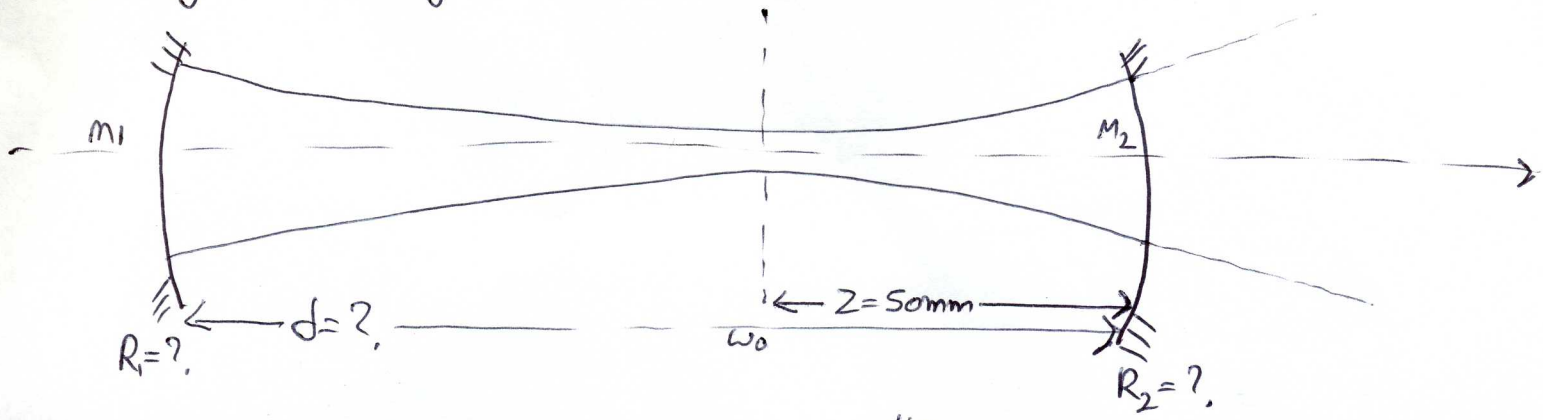


$$\frac{\omega_0'}{\omega_i'} = \frac{1}{\left[1+\left(\frac{\pi\omega_i'^2}{\lambda R'}\right)^2\right]^{1/2}}$$

$$\Rightarrow \boxed{R' = 3047\,mm}$$

now $d' = \dfrac{R'}{1+\left(\frac{\lambda R'}{\pi\omega_i'^2}\right)^2} \Rightarrow \boxed{d' = 846\,mm}$

Case II In case, the beam waist is 5cm from the output window; Inside of the laser cavity: Our cavity should look like this



~~Focus~~ Beam waist, z_0 & divergence will remain the same $\omega_0 = 117\mu m$

$z_0 = 85\,mm$

$\Theta = 4\,mrad$

Curvature of the output window $R_2 = 195mm$